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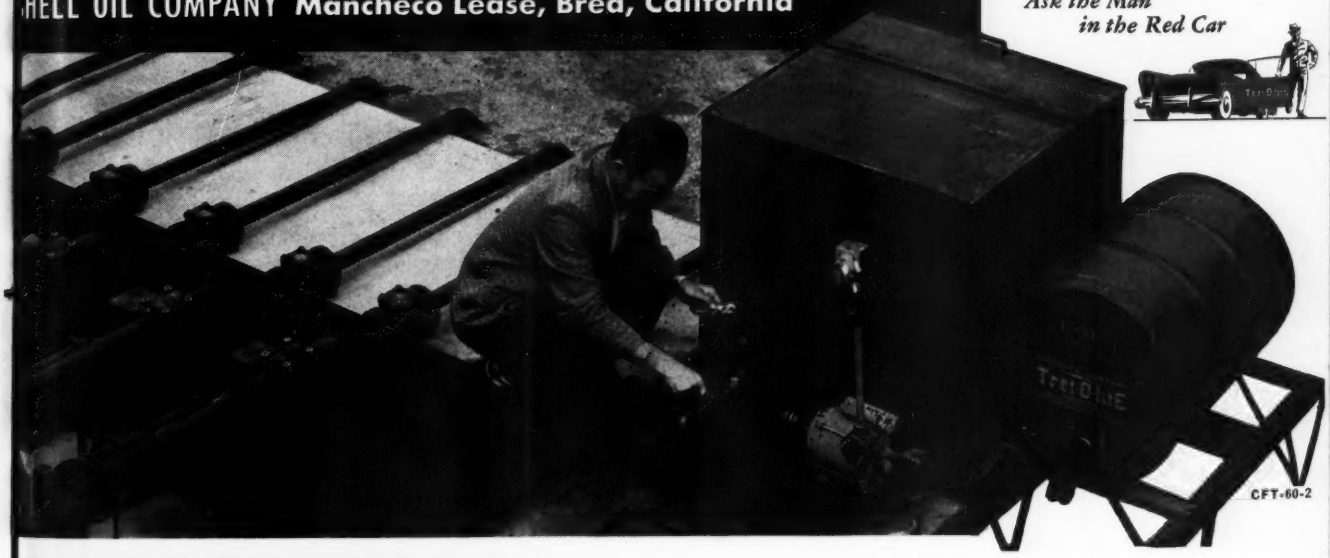

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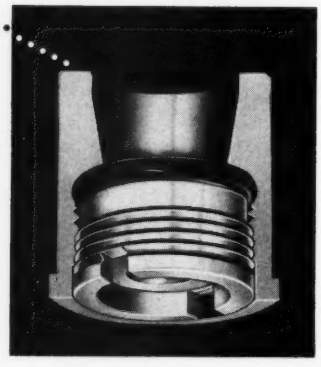
Smith Threaded Flow Nozzle sectioned to illustrate O-Ring and general construction



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OIL WORLD

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A.P.I. Spring Meeting in L.A. May 12 and 13

The final papers have been selected for presentation at the annual spring meeting of the Pacific Coast District Production Division of the American Petroleum Institute scheduled for May 12 and 13.

The banquet and all technical sessions will be held in the Biltmore Bowl, Biltmore Hotel, Los Angeles.

The papers include a wide range of subjects of interest to personnel engaged in drilling and production phases of the oil industry.

Management Address Thursday Afternoon, May 12

The management address scheduled for Thursday Afternoon will be presented by **Howard G. Vesper,** president, Standard Oil Company of California, Western Operations, Inc. **"What's Ahead for the California Oil Producer by 1965"** will be the title of Mr. Vesper's address.

Banquet Thursday Evening, May 12, 6:30 p.m.

Floyd E. Schoonover, general chairman, has announced that the banquet speaker Thursday Evening will be **Dr. Harrison Brown,** professor of Geochemistry, California Institute of Technology, Pasadena. The topic of Dr. Brown's talk will be **"The Next Hundred Years."**

Also, the "Citations for Service" awards will be presented at the banquet by L. E. Fitzjarrald, Phillips Petroleum Co., vice president for production, A.P.I.

All those who plan to participate are urged to make reservations and secure banquet tickets as soon as possible.

Mr. Floyd E. Schoonover, general chairman of the meeting has announced the following program for the Technical Sessions:

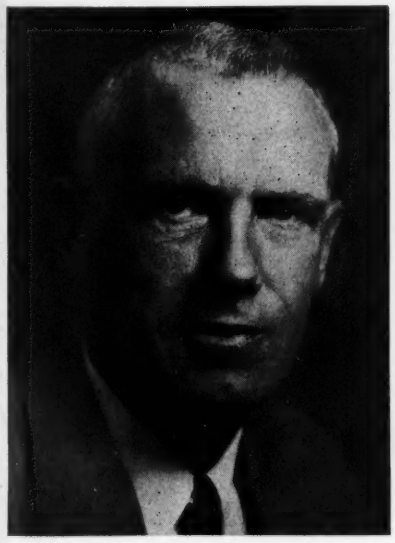
Technical Sessions—Thursday and Friday—
Biltmore Bowl

THURSDAY MORNING—MAY 12—9:00 A.M.

"A NOTE OF WELCOME"
by Floyd E. Schoonover, *Monterey Oil Company*

"LABORATORY INVESTIGATION OF SILICON TETRACHLORIDE FOR CONSOLIDATION OF LOOSE SANDS"
by John K. Kerver and Warren E. Holland, *Humble Oil and Refining Co., Houston, Texas*

"PROBLEMS OF DEEP DRILLING"
by H. W. Patterson, *Phillips Petroleum Co., Bartlesville, Oklahoma*



James N. Gregory
Chairman

Howard G. Vesper
Management Address

Dr. Harrison Brown
Banquet Speaker

T. O. Roe
Halliburton Oil Well Cementing Co.
General Arrangements Chairman

J. B. Hundley
Richfield Oil Corp.
Chairman, Drilling Session

Floyd E. Schoonover
Monterey Oil Company
General Chairman

"A CONTRACTOR LOOKS AT HIS DRILLING CONTRACT"
by John S. Hagestad, *John S. Hagestad Drilling Co.*
"AN OPERATOR LOOKS AT HIS DRILLING CONTRACT"
by W. J. Johnston, *Standard Oil Co. of Calif., Western Operations, Inc.*
"RECENT DEVELOPMENTS IN FLOATING DRILLING BARGE OPERATIONS"
by James W. Murray, *Western Offshore Drilling and Exploration Co.*
"DIRECTIONAL DRILLING—PACIFIC COAST AREA"
by J. A. Hamman, *Eastman Oil Well Survey Company*

THURSDAY AFTERNOON—MAY 12—2:00 P.M.

BUSINESS MEETING
"THE COMPLETION OF WATER INJECTION WELLS IN THE WILMINGTON FIELD, CALIFORNIA"
by Frank H. Kratka, Jr., *Union Pacific Railroad Co.*
"DRILLING SHALLOW SALT WATER SOURCE WELLS"
by E. T. Sullivan, *Long Beach Oil Development Co.*
MANAGEMENT ADDRESS—by Howard G. Vesper, *Standard Oil Company of California, Western Operations, Inc.*

FRIDAY MORNING—MAY 13—9:00 A.M.

"WATER QUALITY CONTROL FOR SUBSURFACE INJECTION"
by Charles C. Wright, *Oil Well Research, Inc.*
"CURRENT WATER FLOOD PRACTICES IN CALIFORNIA"
A report submitted by the Study Committee on Fluid Injection, Committee on Production Practice, Pacific Coast District; presented by Charles H. Jones, Jr., *Long Beach Oil Development Co.*
"METHODS OF DETERMINING WATER INJECTION WELL PROFILES"
by W. D. Sauer, *Long Beach Oil Development Co.*
"DIGITAL COMPUTER APPLICATIONS TO SECONDARY RECOVERY PERFORMANCE PREDICTIONS"
By D. D. Smith, *California Research Corp.*, and T. D. Mueller, *Standard Oil Co., of California, Western Operations, Inc.*
"WATER FLOOD PERFORMANCE OF THE HIBBERD POOL, CUYAMA, CALIFORNIA"
by Leland V. Gefvert, *Richfield Oil Corp.*
"PERFORMANCE OF A PERIPHERAL WATER FLOOD, MAIN AND UPPER 99 EAST POOLS, WEST COYOTE FIELD, CALIFORNIA"
by T. D. Cramer and R. E. Ustick, *Standard Oil Co., of California, Western Operations, Inc.*
"SYMPOSIUM ON UNITIZATION"
1. Foreword by Mervin T. Miller, *Standard Oil of California, Western Operations, Inc.*
2. The Petroleum Engineer's Role In Unitization
by W. B. Emery II, *The Ohio Oil Company*
3. The Landman's Role in Unitization by James C. Austin, *Richfield Oil Corp.*
4. Legal Aspects of Unitization by Richard C. Bergen, *O'Melveny and Myers*
5. A Landowner Looks At Unitization by E. P. Burtchaell, *Kern County Land Co.*

FRIDAY AFTERNOON—MAY 13—2:00 P.M.

"CASE HISTORY—RESULTS OF LEASE AUTOMATIC CUSTODY TRANSFER"
by W. J. Fairbanks, *Shell Oil Co., Farmington, New Mexico*
"SURVEY AND ANALYSIS OF CALIFORNIA WELL STIMULATION PRACTICES"
A report submitted by the Study Committee on Production Technology, Committee on Production Practice, Pacific Coast District; presented by Chester A. Davis, *Richfield Oil Corp.*
"A STATUS REPORT ON MULTIPLE COMPLETIONS IN CALIFORNIA"
by Robert A. Kent, *Baker Oil Tools, Inc.*
"HIGH DENSITY POLYETHYLENE PIPE IN THE PETROLEUM INDUSTRY"
by Leo B. Croley, *Phillips Petroleum Company, Bartlesville, Oklahoma*
"DISSOLVED-AIR FLOTATION AS APPLIED TO THE TREATMENT OF OIL PRODUCTION WATER AND OF REFINERY WASTES"
by William J. Katz, *Chain Belt Co., Milwaukee, Wisconsin*

R. H. Newman
Long Beach Oil Development Co.
Chairman, Production Session

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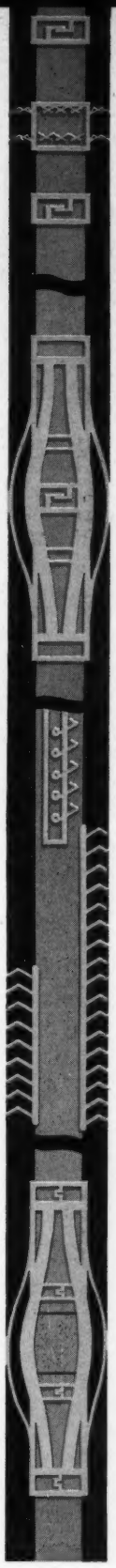

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Petroleum LORE and LINGO

By RICHARD SNEDDON

Primary Considerations

Up to this time we have learned how the hydrocarbons that constitute petroleum are divided into fractions of progressively higher boiling ranges by simply applying heat to the vessels in which the oil is contained, and then condensing the vapors that are given off in different areas of a series of tall distillation columns. By means of outlets at varying elevations in these columns, the fractions are segregated in a continuous series from the lightest (at the top) to the heaviest (at the bottom). This, then, is the initial aim of the refiner, to sort the products of petroleum into a range of base stocks for subsequent treatment and/or blendings.

We have also learned that by increasing the temperatures and pressures of such operations we can change the constitution and properties of the petroleum hydrocarbons, and by the additional use of catalysts can not only accelerate these same reactions but can institute many others. This, indeed, is the untold part of the refining story . . . the reshaping or reforming of the stocks already accumulated so that they can be of the greatest value to industry and society.

Combining The Molecules

Alkylation, superficially discussed in a prior chapter, is an important and commonly used process in this category. It brings about a melding of two comparatively light components, iso-butane, ($C_4 H_{10}$), and butene, ($C_4 H_8$), to form iso-octane ($C_8 H_{18}$), the daddy of all the anti-knock hydrocarbons, an invaluable constituent in top grade aviation gasolines, and those that are required by the higher compression automotive engines of today. This is a species of polymerization (building up), as opposed to cracking which is a breaking down of the larger molecules into smaller ones. The chemical reaction for the alkylation reaction will be found in the chapter on petroleum chemistry.

Oil of Vitriol

The union of the two little molecules in this instance is facilitated by an unusual catalyst, strong sulphuric acid ($H_2 SO_4$), sometimes known as "oil of vitriol," a pretty dangerous commodity, which was originally distilled from a glassy appearing salt of copper and hence takes its name from the Latin **vitrium,** meaning "glass." I had an adventure with this substance once that thoroughly convinced me of its viciousness. When I was a chemist for the Purity Flour Mills of Canada many years ago, one of my chores was to perform a number of Kjeldahl tests on wheat samples to determine their nitrogen content and thence their protein content. The first step in this method was to dissolve the wheat in concentrated sulphuric acid, so we kept a goodly stash of the fearsome liquid on hand, and thereby hangs quite a tale.

Taking Over The Vault

Whether it was because the chief chemist didn't like my looks or I had really become a smart cookie at performing Kjeldahl tests, I don't know, but in any case when it was decided to install a cereal laboratory out in the Calgary mill, I was sent out from Winnipeg to do the job. The new laboratory was to be in a separate building from the main office and it had a big cement vault in it with steel door an inch thick. It would have taken Keenan Wynn and Bob Mathias a month to demolish the thing, so it was decided just to leave it there, equip it with adequate shelving, and let me use it as storage for chemicals and assorted lab ware.

About Winchesters

In the meantime, I had ordered several dozen winchesters of sulphuric acid, and the other reagents I needed, and was getting the place in shape to begin operations. My supplies came in due course and after they were unloaded, I opened the crates and began to carry everything inside. The weather was good; I was launched on a new enterprise; and all the world was a glad song. I was consequently in excellent humor as, whistling loudly off-key, I strode into the vault, swinging a winchester of sulphuric acid in each hand.

I was a natty little guy in these days and at the moment was rigged out in a very light gray suit and a pair of buckskin-topped shoes which I thought was a pretty sharp ensemble. But my self satisfaction was rudely jolted presently when I crashed one of the winchesters against the edge of the vault door, sending a cascade of syrupy acid over my pants legs and buckskin shoes, and leaving nothing in my right hand but the neck of the bottle. (A winchester was a tall bottle that must have held about a gallon of fluid.)

The Clean-Up

For a minute I was stunned but for a minute only. I had to act without delay or risk having my legs chewed off up to the knees. Since some of my friends were disrespectful enough to believe that my legs had already been chewed off and had made frequent wisecracks about the matter, I determined to save such underpinning as I had if at all possible. As fast as I could do it, I unlaced my lovely shoes which were disintegrating with amazing speed, and tore them from my feet. With even greater speed I wrenched off my trousers and shorts. By this time my hands were covered with acid and my legs were beginning to nip, so I jumped up into the sink, turned the cold water on full blast and washed like mad.

I finally managed to get rid of the last traces and would normally have felt relieved, but it is not easy to feel relieved when one is in one's shirttail in a more or less public place. I was frightened silly that one of

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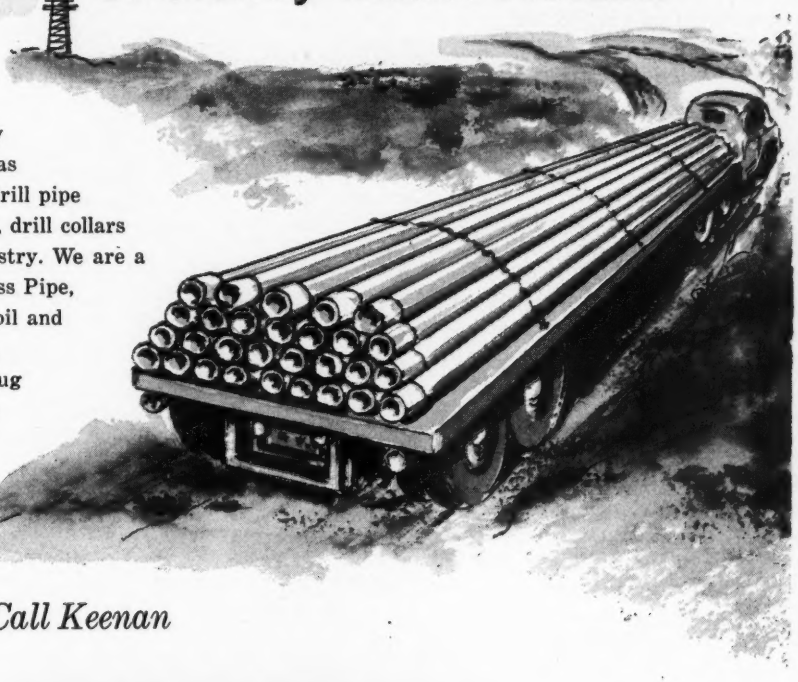

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the girls would come in from the office to have me check an invoice or something of that sort. This was just my second or third day on the job so I was hardly known yet to the local staff and I had fears of making a distinctly unorthodox first impression.

The Grand Finale

The one person I knew really well was the chief accountant. I called him by phone and told him of my predicament, begging him in the name of common decency to rush someone to a nearby second hand store for some shoes and pants, any size. By this time my acidified trousers were practically legless; the buckskin of my buckskin shoes was shredded beyond recognition; and both were emitting acrid smog like nobody's business. Meantime, I locked myself in and was fortunate to have no visitors. When my new outfit arrived, the pants were altogether too loose under the arms and I had to stuff packing straw in the brogans to keep them on my feet but, anyway, they felt good and I was able to stop blushing. It took me quite a time thereafter to mop up the acid from the cement floor which it was eating up voraciously. However, by dint of some stout application I finally made it, and ever since I have hated sulphuric acid with an ungovernable hate.

Back To Alkylation

Returning now to the alkylation process, discussion of which was going along quite smoothly until the rude interjection of the acid adventure: The method of bringing the two components, isobutane and butene, into chemical union is a relatively simple one. At a temperature of 40° F and a pressure of 90 pounds per square inch, these hydrocarbons are liquid and they don't mingle very well with the sulphuric acid. Pumps and impellers are thus employed to keep them thoroughly admixed. They are then given a further agitating by being circulated through a system of pipes and vertical tanks in order to expose them to interreaction for a sufficiently long time. When they have had enough of this, they are flowed into horizontal settling tanks where the mixture separates into layers, the alkylate being drawn off at the top and and the heavy sulphuric acid at the bottom.

The conversion is usually not complete on the first run and after subjecting the treated stock to distillation, part of it is again given what in the vernacular is known as "the business." The so-called "light alkylate" that is recovered in this process is excellent blending material for the compounding of top grade fuels. It may constitute the major proportion of the best aviation gasoline and be present to a lesser extent in top grade automotive fuels.

Following The Gas Stream

Reverting back now to the field separators whence we followed the oil stream at least part way through the refinery, we pick up the lighter elements, the wet gas sometimes called casing head gas, which comes over the top, and see if we can trace its meanderings. This material consists largely of the first five members of the paraffin series of hydrocarbons, methane, ethane, propane, butane, and pentane. Methane and ethane are gaseous in form at atmospheric temperatures and pressures, and are known to the industry as natural gas. Most of this is used as fuel but as we shall learn later, a portion provides the base for some interesting synthetics that are meeting with a growing popularity. Propane and butane have become known as L.P.G. (liquid petroleum gas) because they are maintained in liquid form in pressure cylinders and are sold widely in rural areas tor home cookers and heaters of infinite variety. Pentane is one of a number of light hydrocarbons that together are known as natural gasoline. This is normally blended into commercial gasolines in the proper concentration to give them quick starting qualities.

Dehydration

Gas, as it is produced at the well, like oil may contain some water which to begin with is extraneous, unnecessary, corrosive, and in addition can form compounds that freeze and constrict pipe lines. It must, therefore, be removed at the earliest moment. This can be done by exposing it in an absorption tower to some hygroscopic substance which absorbs the water without entering into any chemical reaction with the gas. There are many of these. (The class derives its name from the Greek hygros, "water".) One commonly used in gas dehydration is glycol which is a glycerine compound that can be made from petroleum, and can be freshened up for further use by simply boiling off the water. The gas bubbles up through a counter stream of glycol and when it has lost all or most of its moisture is ready for pipeline transportation to a processing plant, usually located in or near the oil field from which it originally came.

The term "wet gas" does not necessarily imply that it contains water. In that sense it may be quite dry. Actually, even after dehydration, the gas stream usually contains considerable quantities of liquid hydrocarbons that can be segregated and utilized in many ways. It is because of this condensable liquid content that it is called "wet." One of the main functions of the gas plant is to separate the lightest members, methane and ethane, from these liquefiable portions, and to fractionate the latter also into several desirable increments, for example, propane, pentane, and other light hydrocarbons collectively known as natural gasoline, and some still heavier ones that are less definitively known as condensate.

Repressuring

The natural gas, or "dry gas" as it is sometimes termed for obvious reasons, serves many useful purposes. It may be sent back down to the underground reservoir, whence it emanated, to boost waning pressures and help lift the remaining oil. It has already been noted that there are four distinct oil well production phases, flowing, gas lift, pumping, and secondary recovery. In these, natural gas can be anything from the main energy contributor to simply a material aid. Even in a pumping well it may ease the mechanical strain by giving added buoyancy to the oil. When it is recycled into the reservoir, as in the "gas lift" procedure, to build up dwindling pressures, it becomes saturated on each trip with a fresh load of valuable condensables which are then extracted at the gas plant instead of being left underground. Sometimes it is injected into the subsurface reservoir at a strategic point to drive oil to a series of production wells, a process known as "gas drive," and, of course, it is also an excellent fuel for both domestic and industrial purposes.

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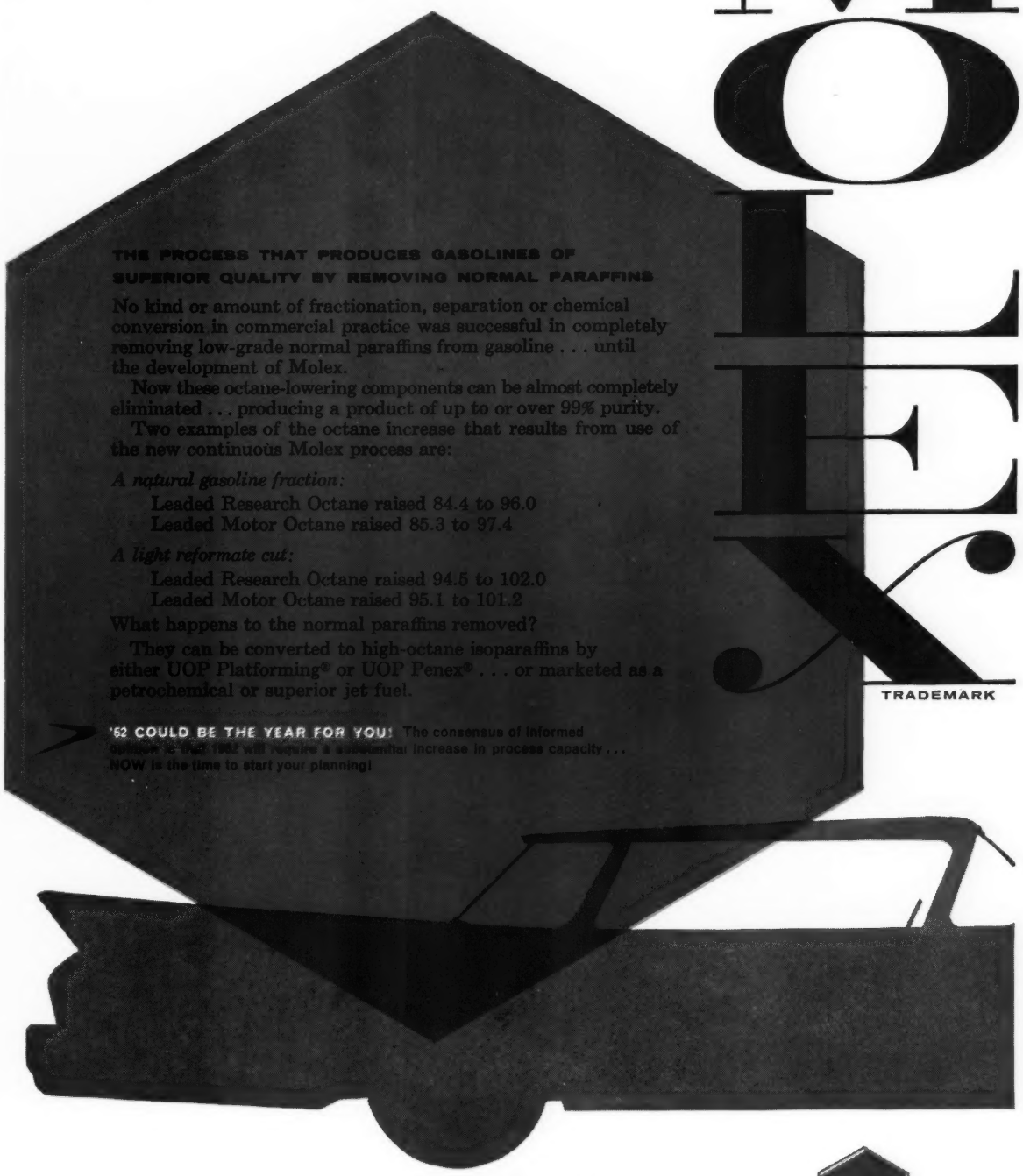

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When gas is sufficiently compressed at below normal temperature its heavier components liquefy and may be drained off. At the same time the build up of pressure gives the gas more power to penetrate the underground formations and drive oil ahead, or to lift oil that no longer is buoyant enough to rise by itself. Compressors thus are an important element in the gas plant set up. They usually build up the pressure in stages for injection purposes, depending on the pressure already existent in the oil reservoir.

Fractionation

The various liquefiable products, including natural gasoline and condensate, are submitted to fractionation by first heating and then separating into appropriate boiling range portions, in columns somewhat similar to those described in the refining of crude oil. Condensate, for example, after heating, is robbed in this manner of any light material it might contain (mostly butane) and is then stored as debutanized condensate. The separations are most completely accomplished in absorption towers. These are tall vessels with layer upon layer of trays inside. Over these trays flows a stream of oil that has a special affinity for the propanes, butanes, pentanes, etc. Gas is admitted via a series of inlets and bubbles up through the absorption oil and, of course, the liquefiable products are thus extracted from the gas.

Distillation

The rich absorption oil is then stripped of its extract by heating and the latter is then as usual separated into the desired fractions. The whole purpose of the gas plant is as far as possible to isolate the various components in pure form or at least in such combinations as are best suited to the needs of the petroleum industry and its patrons. The function of the dry gas has already been explained. Propane and butane, it has been noted, are furnishing rural communities all over the United States with clean, convenient and instantly obtainable heating and cooking power. Natural gasoline and condensate are mostly used in the refineries for blending, either before or after subsequent treatment, with commercial gasolines.

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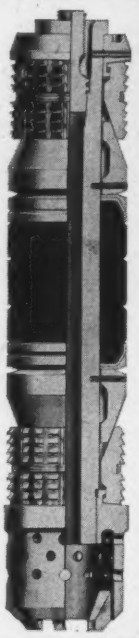

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OTIS ENGINEERING CORPORATION

General Offices: 6612 Denton Drive • Dallas

Extraneous Substances

Certain impurities are sometimes found in the gas as it comes from the well, notably carbon dioxide and hydrogen sulphide, and it is necessary that these be removed so that they will not adversely affect the succeeding operations. Carbon dioxide is commonly used as a fire extinguishing agent and its presence in the gas would reduce its calorific or heat value. Hydrogen sulphide is a smelly, and quite corrosive compound, and its removal at the earliest stage in the proceedings is by all means desirable.

The carbon dioxide is absorbed in another tower in which the absorbing regent is a polysyllabic fluid called monoethanolamine, usually simplified to MEA. The gas as before bubbles up through trays of the MEA solution and its carbon dioxide is dissolved out. The solution is then directed to a reactor column where the carbon dioxide is driven off by heating. It is later compressed, cooled to liquid form, and when released in easy stages to atmospheric pressure, makes a carbon dioxide snow which in turn is briquetted and sold as "dry ice," for a multitude of uses.

The hydrogen sulphide is removed in still another column, containing an aqueous solution of soda ash (sodium carbonate) in which iron oxide (a fancy name for rust) is suspended. As the gas passes through this the hydrogen sulphide is mostly changed to iron sulphide which remains with the liquid. Any that is not removed in this first pass is caught later as the gas percolates through several other towers containing wood shavings impregnated with iron oxide.

The Recap

Back in the old days the gas from oil wells was called "casinghead gas" because it flowed from the head of the casing, and such gasoline as might more or less accidentally condense from it was "casinghead gasoline." It was all pretty much of a nuisance then. The gas was burned to the air just to get rid of it and the extremely volatile liquid it contained was too frisky to be bothered with. Today every vestige of oil well gas is put to some worthwhile use and what was once a sort of outlawed phase of the petroleum industry has now become in itself a major industry.

Rich Strike Made By California Oil Industry

Yes, for eleven years the California oil industry has been striking it rich with a "real do something" youth movement. Camping, hiking, swimming and fishing in the mountains is the dream of every boy, rich or poor. Each year these dreams come true for about 400 needy and deserving boys who are guests of the oil industry at the R. M. Pyles Boys Camp in the High Sierras. R. M. Pyles, founder of the camp, is a veteran oil man of some 45 years and his enthusiasm for helping young men has paid off handsomely. "Less than two per cent of the boys attending our camp ever get into serious trouble after camp affiliation," Pyles relates.

Boys selected for a two-week stay at the camp come from the oil producing counties of California and are chosen for attendance by members of the various law enforcement agencies. The boys are from 12 to 16 years old and are those who could benefit from a two-weeks outdoor life in the mountains.

Since establishment of the camp more than 3200 boys have fished in its streams, ridden horseback on surrounding ridges, swam in cool mountain pools and learned about nature in the great classrooms of the outdoors. They also learn self discipline, citizenship and a most important aspect, that of getting along with others. "Learning to work together, to play together and to worship together with boys of all faiths and racial backgrounds seems to do something to a boy's philosophy. He begins to think it's a pretty wonderful world and determines to try and keep it that way in his life and ambitions", says Bob Pyles.

Flag Ceremony at the R. M. Pyles Boys Camp

Last year a milestone was reached with the completion of the camp's winter headquarters in Huntington Beach. Here, during the winter months, the most necessary follow-up program can be carried out. This winter camp provides recreational facilities for the boys and they are also taken on interesting side trips to Marineland, Disneyland, etc. Help in the boy's social life and with his problems is ever-continuing and sometimes just a pat on the back and a "'stay in there boy" is the key to giving a boy a real helping hand.

The California oil industry has been wildcatting in the human equation and struck it rich. The purpose, "to find the poor and needy, the underprivileged boys whose bodies are undernourished, whose thoughts are clouded by fear, whose hearts are heavy from lack of love and understanding, and rebuild them into healthier and happier generation of Americans, firmly endowed with the ideals and principles of our freedom loving country."

This is an oil industry program, one which you as a member of the industry can be proud, but it takes a lot of work and a lot of money too. You can help by sending your contribution to the R. M. Pyles Boys Camp, P.O. Box 191, Huntington Beach, California.

Boys Attending the R. M. Pyles Boys Camp Play Volleyball in the Mountains

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Texaco Announces Erection Of Offshore Drilling Facilities Will Begin About May 15

Texaco Inc. recently announced that erection of a double-deck steel platform for drilling and production facilities on its Texaco-Monterey state offshore lease near Gaviota, 30 miles west of Santa Barbara, will begin about May 15.

J. H. Puls, manager of Texaco's Los Angeles producing division, said that the platform will be erected by Mid Valley, Inc., a subsidiary of Brown and Root. It is scheduled to be in place and ready for operation within 60 days after May 15. Drilling operations from the platform will begin as soon as construction is completed. A drilling contract has been let to Caldrill Offshore, Inc., Ventura.

Texaco Inc. is the operator of the 3,840-acre state lease for itself, Montrey Oil Company and the Newmont Oil Company. The lease is one of several which were awarded by the state of California offshore from Gaviota.

The platform will be erected in approximately 94 feet of water, about 1½ miles offshore. It will be a double-deck jacket-type platform erected on steel piling driven 70 to 80 feet into the ocean floor. The top platform will be approximately 50 feet above the water level. Each deck will measure approximately 130 feet by 138 feet. The platform could eventually accommodate 28 wells, Puls said.

The jackets, or supporting members of the platforms, are being built at the Southwest Welding and Manufacturing Division of Yuba Consolidated Industries, Inc., Long Beach. They will be floated, along with the deck sections, to the drilling site early in May.

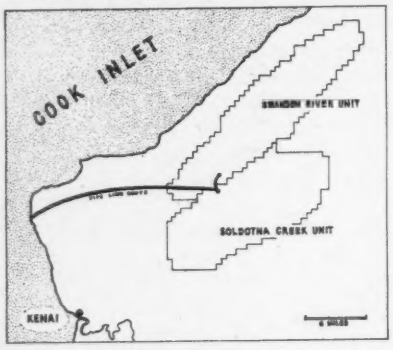
The first step in the erection program will be to set the steel jackets in place on the ocean bottom. Piling will be driven through the upright tubular members of these steel jackets into the ocean floor.

$4 Million Pipe Line For Standard in Alaska

Plans for construction of a 20-mile common carrier crude oil pipe line and marine terminal facilities on Alaska's Kenai Peninsula were announced this month by Standard Oil Company of California, Western Operations, Inc.

Total cost will be more than $4 million and completion is scheduled by mid-1961.

The project will include an eight-inch line to a new marine terminal at Nikiski on the Cook Inlet twenty miles to the west of the producing area with pumping stations and a pattern of feeder lines in the Soldotna Creek and



Swanson River Unit oil fields. It will be owned by the Kenai Pipe Line Company, a newly-formed operating affiliate.

Initial construction of storage facilities at Nikiski will begin in several weeks. Work on the line itself will start as soon as right of way arrangements are concluded.

The entire project will be coordinated with the Fish and Wild Life authorities to assure proper observance of conservation requirements.

Completion of the pipe line will eliminate present limited trucking of crude oil to Seward on the southeast coast of the peninsula.

Principal engineering problem in the project will be construction of the marine terminal on the Cook inlet. Excessive tidal action there produces tidewater velocities of up to seven knots and water level variations of 25 feet. The terminal itself will consist of a 1000-foot causeway leading out to a dock at minimum water depth of forty feet. It will be designed to accommodate tankers of up to 28,000 deadweight tons.

The main pipe line will include a pump station at its inland terminus and a feeder station four miles to the north in the center of the Swanson River producing area.

Universal Reports Partial-Year Earnings of $3,243,202

Net earnings for Universal Oil Products Company, Des Plaines, Ill., from the start of operations in its present corporate form Feb. 12, 1959, until year-end totaled $3,243,202, shareholders were told in the annual report mailed March 30. This was equivalent to $1.12 per share of common stock for the partial year.

The company reported gross revenues of $65,359,306 for the period. Cash flow amounted to $8,082,282, equivalent to $2.79 per share.

(Earnings for the period cannot be directly compared with those of the predecessor company for previous years, since the present company's capitalization is on a substantially different basis.)

In a letter to shareholders, David W. Harris, chariman and chief executive officer, and Maynard P. Venema, president, reported that "several promising new petroleum refining and petrochemical processes, new catalysts and other chemical products resulted from research and development activities." The most recently announced of the new refining processes, Lomax*, is said to "have the potential for more economic manufacture of gasoline and other refinery products of superior quality."

Commenting on increased foreign petroleum refining activity, the Report revealed that approximately half of the company's licensing sales volume during 1959 was for installations outside the U.S. and Canada.

In connection with its program of diversification, the company referred to Purzaust**, announced late in the year, as a development that may have far reaching significance. Purzaust is a catalytic device for treatment of automotive exhaust gas to reduce the concentrations of carbon monoxide and unburned hydrocarbons to levels recommended by public health authorities.

As a further step in its diversification program, Universal told shareholders it has recently concluded an agreement to purchase for approximately $6,000,000 the capital stock of The Trubek Laboratories, East Rutherford, N.J., using cash generated through operations, with no new equity or capital financing. The newly-acquired company produces a diverse line of aroma chemicals for the soap, perfume and cosmetic industries and also chemical intermediates for the pharmaceutical, electroplating and other chemical industries. Universal said the Trubek operations are expected to benefit from UOP's research, development and technical service activities in the chemical specialties field.

*Lomax is a trademark of Universal Oil Products Co.
**Purzaust is a trademark of Universal Oil Products Co.

Union Oil Company Active in Sahara

With equipment and supplies being unloaded in northwest Africa, Union Oil Company will probably be the first American firm to begin exploratory drilling for oil in the Spanish Sahara, according to E. C. Babson, Union's manager of foreign operations.

"Union and its partner, Compania Iberica de Petroleos, have been granted three concessions totalling 1,750,000 acres," Babson said. "Union Oil holds a 70% interest in the partnership.

"The first drilling site will be selected immediately after completion of final seismic surveys now underway.

"Two of the blocks have a combined coastline of 50 miles. Offshore exploratory rights extending to the Continental Shelf or international boundary go along with the blocks. This gives Union much more exploratory area than if all concessions were inland."

Union's operating headquarters will be in Las Palmas on Gran Canaria Island, about 144 miles from El Aauin, one of the only two towns in the Spanish Sahara. Both towns are military garrisons.

D.A.B. DE-ACTIVATE BENTONITE

A new chemical additive for water to **permanently** de-activate the swelling of Bentonitic shales and clays. **D.A.B.** controls and limits the amount of water associated with clay swelling. Compatible with all acids and surfactants for the following uses:

1. Oil Well Stimulation and well washing.
2. **Inorganic or organic acid jobs.**
3. Wash — to remove swollen clays — to release water block.
4. **Mud-cake removal.**
5. Completion fluid in conjunction with clay base or oil emulsion muds.
6. **Ordinary clay base drilling mud.**
7. Fracing.
8. **Advance water flood procedure.**
9. Cementing, etc. — whenever it is desired that filtration or encrcachment of water **will not** have a harmful effect on Bentonitic shales or clays.

SIEVERS, INC. 1539 Harbor Ave., Long Beach 13, Calif. Long Beach HEmlock 7-3591 Los Angeles SPruce 5-2891

Summary of District V Oil Industry Conditions January (and Feb. Prelim.) 1960

By Oil Producers Agency of California

Weekly figures for February indicate that total supply was 1,364,000 barrels, demand was 1,441,000 barrels, and stocks decreased 77,000 b/d. This decrease, 2,233,000 barrels for the month, would bring stocks to 122,431,000 barrels on February 29, compared with 137,909,000 on February 28, 1959. The year's decrease was 15,478,000 barrels.

Crude Production and Stocks

The Oil Import Administrator reports that 240,070 b/d of crude and unfinished oils, including 49,176 b/d of exempt Canadian imports, were imported in January. In addition, 4,787 b/d of products were imported.

Preliminary figures for February indicate that crude production was 329,000 b/d, imports were 255,000 b/d and stocks increased 34,000 b/d. This increase, 986,000 barrels for the month, would bring stocks to 34,220,000 barrels on February 29, compared with 41,009,000 on February 28, 1959. The year's decrease was 6,789,000 barrels.

Gasoline Supply, Demand, and Stocks

Preliminary figures for February indicate that gasoline supply was 589,000 b/d, demand was 545,000 b/d, and stocks increased 44,000 b/d. This increase, 1,276,000 barrels for the month, would bring gasoline stocks to 35,147,000 barrels on February 29, compared with 31,669,000 on February 28, 1959. The year's increase was 3,478,000 barrels.

Distillate Fuel Supply, Demand, and Stocks

Weekly figures for February indicate that distillate fuel supply was 209,000 b/d, demand was 228,000 b/d, and stocks decreased 19,000 b/d. This decrease, 551,000 barrels for the month, would bring stocks to 13,036,000 barrels on February 29, compared with 12,870,000 on February 28, 1959. The year's increase was 166,000 barrels.

Residual Fuel Supply, Demand, and Stocks

Preliminary figures for February indicate that residual fuel supply was 293,000 b/d, demand was 377,000 b/d, and stocks decreased 84,000 b/d. This decrease, 2,436,000 barrels for the month, would bring stocks to 16,841,000 barrels on February 29, compared with 28,861,000 on February 28, 1959. The year's decrease was 12,020,000 barrels.

IPAA Takes Exception To Import Increase

Statement By Alvin C. Hope, President, Independent Petroleum Association Of America

On April 9 Secretary of the Interior Seaton authorized an increase in the allocations of residual fuel oil imports of 12 million barrels, or 132,000 barrels daily, for the remainder of the first half of this year.

This action was taken, according to a release by the Interior Department, because of higher than anticipated demands resulting from cold weather in March and because "A few importers, as a result of their marketing policies, have already exhausted or virtually exhausted their initial six months allocation. Individual consumers may, therefore, find it difficult in some cases to obtain supplies from usual sources."

It is the responsibility of the government, under the import program, to make certain no real consumer shortages occur as a result of its policy to limit petroleum imports.

We recognize that in the interest of maintaining the integrity of the program it is essential that the government take whatever action necessary to prevent any shortage from occurring. We in IPAA, of course are in no position to assess individual company situations. However, according to published statistics as to inventories and prices there is no indication at this time of any overall shortage.

For example, on the East and Gulf coasts, inventories of residual fuel oil as of April 1 of this year, although lower than last year at this time (following a period of unprecedented high imports), are at about the same level as on April 1, 1958 and higher than they were on April 1, 1957.

In addition, residual fuel oil prices in these areas remain at depressed levels. Gulf Coast prices on April 1 were $2.10 a barrel compared with $2.00 at the same time in 1959 and $2.25 a barrel on April 1, 1958. New York harbor prices on April 1 were $2.37 this year and in 1959 and $2.65 in 1958.

We recognize the necessity for flexibility, but repeated adjustments endanger the long range stability of the entire oil import program.

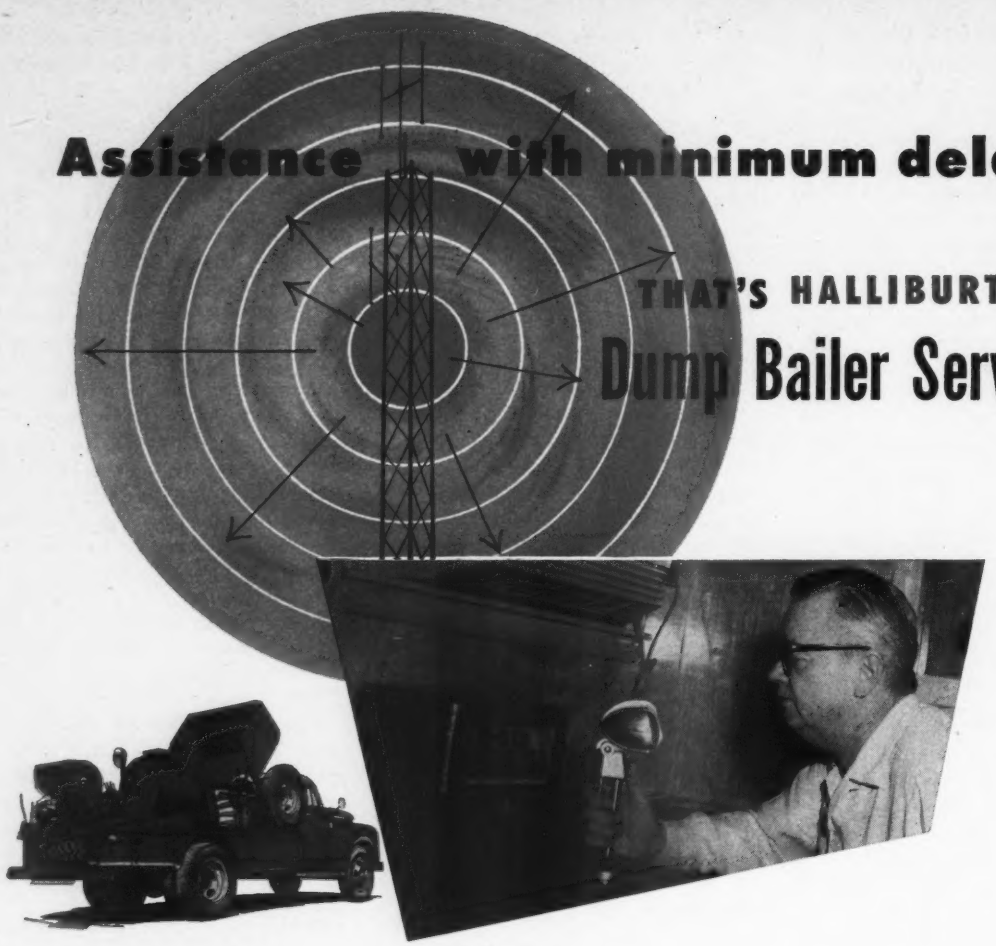
One method of providing this flexibility which would eliminate these repeated adjustments has been previously suggested by this Association. If each importer of crude oil had the option to import residual fuel on a barrel-for-barrel basis to be charged against his crude oil allocation, the large importers of crude oil (who generally are the large suppliers of residual) then would be in a position to correct, by their own action, and in accordance with individual company needs, the very situation which, under the present allocation system, has required government action.

Crude and unfinished oils imports were distributed as follows:

Company	Calif.	Dist. V	Total	Calif.	Dist. V	Total
Caminol	2,114		2,114	2,800		2,800
Douglas	4,104		4,104			
Envoy				3,600		3,600
Fletcher	4,083		4,083			
Golden Eagle				4,300		4,300
Macmillan	3,343		3,343			
Mohawk	7,258		7,258			
Powerine				5,000		5,000
Richfield	21,264		21,264			
Shell	27,835	1,612	29,447		32,000	32,000
Socal	2,496		2,496			
Socony	25,812	24,132	49,944		25,500	25,500
Standard	31,879		31,879	16,100		16,100
Texaco	19,534	23,432	42,966		27,800	27,800
Tidewater	725		725	19,500		19,500
Union	27,668		27,668	14,600		14,600
Wilshire	12,779		12,779	10,500		10,500
TOTALS	190,894	49,176	240,070	76,400	85,300	161,700

Assistance with minimum delay!

THAT'S HALLIBURTON
Dump Bailer Service



When remedial cementing means the loss of costly rig time, or threatens the loss of production itself, you need assistance with a minimum of delay. That's why it pays to call Halliburton Dump Bailer Service. Halliburton is as near as your telephone; all Dump Bailer Service fleet units are radio-equipped for extra-speedy service... available 24 hours a day.

The continuous Halliburton program of Dump Bailer Service development makes available a wide range of materials and equipment tailored for most job requirements. On jobs requiring—bridges, plugs, water shut-off, aluminum alloy removal, shot tamps—you are assured of prompt assistance... and service that is based on more than 20 years of Dump Bailer experience.

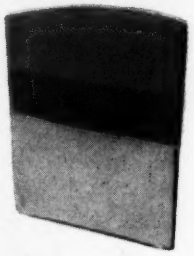
In every phase of remedial cementing operations... tools, equipment, materials, experience, *and* prompt dependable service... Halliburton leads the industry. Call your nearest Halliburton field office for the best and most dependable Dump Bailer Service.

"DB" BRIDGING BASKET

An efficient umbrella type that bridges open holes or casing from 4" to 15" I. D. . . . field-proven in hundreds of dump bailer jobs, the drillable basket has demonstrated its efficiency in wells exceeding 13,000 ft. The "DB" Bridging Basket forms a dumping bridge for additional materials and saves time in isolating formations, locating and repairing casing leaks, squeezing, acidizing and other operations.

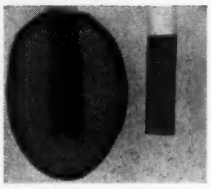
CAL-SEAL

A quick-setting, super-strength gypsum cement especially effective for dump bailer jobs such as bridge plugs, split pipe, blowouts and shot tamps . . . Available in three types for controlled setting to meet special conditions, Cal-Seal's 0.3% lineal expansion during setting tightens plug in hole or fissure. Its rapid strength development and low permeability provide a cementing material that is easy to apply, readily drillable and economical to use.



HYDROMITE

A proven waterproof plastic cement, composed of a special gypsum cement and a powdered resin, particularly adapted for dump bailer equipment . . . The setting time of Hydromite can be controlled to very close limits, with the initial set occurring within 75-100 minutes. It will set in temperatures ranging from 60°F to 225°F. . . Unlike a portland cement slurry, the resin in the fluid phase provides an impermeable seal when squeezed into the formation. This feature, together with Hydromite's 0.3% linear expansion during initial set, makes it a tight non-permeable plug for shutting off bottom hole water in producing wells.



RESIN-CEMENT

A blend of resins, water and Portland Type Cement formulated for individual well requirements. Resin-Cement is effective for open hole bottom plugs and may be placed by dump bailer or by pumping. Has application in most oil, gas or water bearing formations, including sandstone or limestone, with temperatures from 80°F to 230°F. . . Set Resin-Cement is permanent in nature and not normally affected by oil, mud, or corrosive waters or gases.

HYDRO-LOK (PC-11)

Hydro-Lok (PC-11), consisting of a thermosetting resin and inert solids used as bulking agents and for fluid loss control, is especially effective for water shutoff. This material is placed like cement slurry and may be dumped with bailer, if desired. PC-11 sets in one to three hours after being placed in the hole; the resin phase which is squeezed into the water formation sets in less than an hour because of the accelerating action of water.

HALLIBURTON

DUMP BAILER SERVICE

HALLIBURTON OIL WELL CEMENTING COMPANY • DUNCAN, OKLAHOMA

"CONTINUE TO LOOK TO HALLIBURTON—FOR LEADERSHIP"

Personalities IN THE NEWS

Yates Appointed to Union Oil Public Relations Staff

Jay T. Yates, formerly with Pan American Airways' public relations department, has been appointed to the public relations staff of Union Oil Company of California, it was announced recently by **Earl M. Welty,** director of public relations.

Yates had served with Pan American Airways for approximately four years as assistant public relations manager for the Southwest Region.

Yates is a native of St. Paul, Minnesota. He is a former newspaper man and has also written many magazine articles.

Carl E. Totten

Shell Oil Names Totten, Public Relations Manager

Carl E. Totten has been named public relations manager for Shell Oil Company in Los Angeles, it was announced recently by Vice President **S. F. Bowlby.**

He will replace **J. H. Sembower,** who has resigned.

For the past five years Totten has served as Manager of News and Information in Shell's Head Office Public Relations Department in New York. Earlier he had headed the department's Special Projects Division.

Totten, a native of Oregon, joined Shell in San Francisco in 1931. Following service with the Army during World War II he was named public relations representative in San Francisco. He held a similar position in Los Angeles from 1950 until his promotion to New York in 1954.

Texaco Promotes Two Supervising Employees At Wilmington

Two supervising employes of Texaco's Los Angeles refinery at Wilmington have been promoted to higher positions in Texaco's domestic refining department, it was announced in Los Angeles recently by **W. B. Logan,** manager of the Department's Pacific Coast Division.

George Louis, who has been assistant superintendent of the Los Angeles Works, has been named superintendent of Texaco's El Paso, Texas refinery. **Herbert C. Tenny,** area supervisor of the Los Angeles refinery, is being transferred to Texaco's Eagle Point, N. J. refinery as supervisor of operations.

George Patterson, who has been an assistant superintendent of Texaco's Port Arthur, Texas refinery, will replace Louis as assistant superintendent at Los Angeles.

Oil Well Supply Division of U.S.S. Appoints Shuck Field Representative

The appointment of **Harold E. Shuck** as field representative at Taft, California for U. S. Steel's Oil Welf Supply Division was announced recently by **D. S. Grubbs,** California area manager of the division.

Shuck was employed by "Oilwell" in March, 1946 at Taft and appointed field representative at this location in May, 1952. Later he served in the same capacity at Bakersfield, California, where he was transferred in September, 1953.

Keenan Pipe Names Johnson Manager of Contract Sales

Roy W. Johnson, formerly executive vice president of Republic Supply Company of California and one of the best known men in his field, has been appointed manager of contract sales for Keenan Pipe & Supply Co., a leading western distributor of many lines of industrial, oil, plumbing and heating products, according to **P. T. Keenan,** president.

Roy W. Johnson

Johnson will make his headquarters at the main Keenan plant in Los Angeles, but will also be actively identified with their branches in North Hollywood, Bakersfield, San Bernardino, San Diego, Phoenix, Tucson, Las Vegas and Denver.

Johnson brings to his new position a broad background of industrial and oilfield experience. Following graduation in business administration from USC in 1934, he started work for Republic Supply as warehouseman, then was successively in field stores, branch manager, and vice president in charge of the northern division in San Francisco.

Harold Bruwelheide is New BJ Controller and Treasurer

Harold B. Bruwelheide has been named controller and treasurer of the Byron Jackson Division of Borg-Warner Corporation, according to an announcement by **Andrew W. Rose,** BJ president. He replaces **Franklin Sloff,** who is being transferred to a new position at Borg-Warner's Chicago headquarters.

Bruwelheide joined Byron Jackson in 1957, after being associated with the Carrier Corporation and with Dresser Industries in their fiscal departments.

The promotion, Rose said, "is another forward step in BJ's management-in-depth program, dedicated to advancement of personnel from within the Byron Jackson organization."

Kent Petroleum Names New Manager

John Knudsen, Jr., has been elected to the board of directors, and has been appointed to the position of general manager of Kent Petroleum Corporation.

This announcement was made by Kent President, **M. K. Doumani.**

Knudsen is a consulting petroleum engineer, formerly vice president and manager of exploration of Federal Oil Company in Los Angeles.

The appointment of Knudsen, with 20 years experience in the petroleum industry, was taken to advance the gas exploratory activities of the corporation.

SIE Management Team Grows

The appointment of **Howard S. Gleason** as assistant to the president was announced recently by **George A. Peck,** president of Southwestern Industrial Electronics Company, a division of Dresser Industries, Inc. Gleason, who came to SIE from Stromberg-Carlson, served under Peck there as assistant general manager of the Electronics Division.

The addition of Gleason to SIE's growing management team is another step forward in SIE's planned growth for the future.

At its new 300,000 square foot plant facility in Houston, Texas, SIE is engaged in the design and manufacture of automatic supervisory control systems for pipe line, refineries, custody transfer and other industrial applications.

The California Company Names Board Chairman; President

H. C. Teasdel has been named chairman of the board of The California Company, mid-continent producing, exploration and marketing subsidiary of Standard Oil Company of California.

Teasdel will be succeeded as president of Calco by **K. H. Shaffer,** previously board chairman of Standard Oil Company of Texas, another Standard of California subsidiary.

Both appointments were effective April 1.

Teasdel transferred to The California Company from the parent organization in 1941 and was named president in 1947. Shaffer was vice president of Calco from 1952 to 1955, before moving to Sotex.

Bobby D. Graham Appointed Field Representative by U.S. Steel

Appointment of **Bobby D. Graham** as field representative of the Oil Well Supply Division of U.S. Steel at Bakersfield, California was announced recently by **D. S. Grubbs,** California area manager of the division.

Graham was employed by "Oilwell" in March, 1948 at Taft, California. He was named field representative at this location in August, 1953, serving in this capacity until his present appointment.

Graham is a native of Fresno, California.

Clark Oil Negotiating to Acquire Assets of Index

Emory T. Clark, president of Clark Oil & Refining Corporation, announced recently that the boards of directors of Clark Oil & Refining Corporation and Intex Oil Company, a California corporation, have authorized the negotiation of an agreement by which Clark Oil would acquire all of the assets of Intex in exchange for common and preferred stock of Clark Oil. A simultaneous announcement was made by L. R. Seaman, president of Intex, in Bakersfield, California.

Clark, with headquarters in Milwaukee and refineries at Chicago and New Orleans, is one of the leading independent refiners and marketers distributing much of its petroleum products via its own pipeline, lake tanker, and river towboat and barges to more than 650 Clark Service Stations in its nine-state market area.

Johnston Stainless Welding Rods

PROVEN QUALITY SINCE 1931

•

JOHNSTON STAINLESS WELDING RODS INC.

1845 E. 57th St. - Los Angeles 58, Calif.

LUdlow 8-2508

Von Hagen Reelected President of Oil Producers Agency

Richard R. Von Hagen was re-elected president of Oil Producers Agency of California at the annual meeting of the independent oil producers association's Board of Directors on April 13. Von Hagen is president of Lloyd Corporation, Limited.

Vice presidents re-elected were: H. D. Campbell, president of Franco-Western Oil Company and John H. Matkin, vice president of Kern County Land Company. Newly elected vice presidents are Lee S. Osborne, vice president of Union Pacific Railroad Company, and C. G. Williams, vice president of Universal Consolidated Oil Company.

Ross McCollum, president of National Oil Company was re-elected secretary-treasurer and T. D. Bonney, president of Mt. Diablo Co. was elected assistant secretary-treasurer.

Stark Fox was re-elected executive vice president.

Directors re-elected are: H. D. Campbell, president of Franco-Western Oil Company; J. M. Feldman, president of Golden Bear Oil Company; Robert H. Garrison, Manager of Hellman Estate; H. E. Rickard, vice president of Intex Oil Company; Richard R. Von Hagen, president of Lloyd Corporation, Ltd.; Charles T. Wilson, president of The Petroleum Company and Roy W. Young. F. M. Cole, vice president of Honolulu Oil Corporation, was elected to fill the unexpired term of L. A. Cranson, resigned.

D. & D. of Long Beach Honors Mothers and Wives

Desk and Derrick Club of Long Beach paid honor to Mothers and Bosses' Wives, when it held its regular dinner meeting April 20th at the Lafayette Hotel.

Harvey Wood's Town & Country Fashions, presented a fashion show which they called "Around the Clock in Thirty Minutes." Six lovely models (donated by the store) showed clothing suited to morning through after-five wear. Sport and swim wear for which this store is widely noted, was also shown. Commentating was done by Mrs. Harvey Woods.

Door prize this month was through the courtesy of Signal Oil & Gas Company.

Seven Speakers Featured At Exploration Geophysicists Annual Spring Meeting

Seven featured speakers were presented at the Annual Spring Meeting, Pacific Coast Section of the Society of Exploration Geophysicists, at the Hacienda Motel in Bakerfield, Friday, April 8, according to Jay Leith, program chairman.

The day long meeting was climaxed with a dinner at 7:00 P.M., at which Carl H. Savit, Western Geophysical Company, Los Angeles, discussed "Stratigraphy vs. Noise".

Other speakers during the day included: H. Wayne Hoylman, Los Angeles, discussing aeromagnetic interpretation; Stewart Chuber, Bakersfield, reported on geology of Libya; Richard A. Geyer, Houston, surveying gravity and magnetics; B. F. Grossling, La Habra, discussed gravity data; Neal L. Hurley, Anaheim, reported on exploration in Peru.

Thomas L. Slaven, Los Angeles, gave the address of welcome at the morning session. Other committee members, besides Leith, included E. A. Kiesler, arrangements and registration, and Don Olson, publicity and projection. Fred G. Knight, northern vice-president, was general chairman.

First Shipment of Crude Oil From Summerland Announced

The first marine shipment of crude oil produced from Standard-Humble's offshore platform at Summerland was made over the weekend of April 16-17.

The Oregon Standard, T-2 tanker, picked up 125,000 barrels of crude via a 20" submarine loading line from the 217,500 barrel capacity storage tank of the Carpinteria onshore facilities receiving the crude produced from the platform. Loading at a rate of approximately 14,000 barrels per hour, the transfer to the tanker was accomplished in about ten hours.

This cargo was delivered to Standard's Richmond Refinery.

Luncheon Meeting

Dr. G. Oakeshott, deputy chief, California Division of Mines, addressed a luncheon meeting of the Pacific Coast Section of the A.A.P.G. The topic for Dr. Oakeshott's illustrated talk was "Characteristics of Surface Faulting in Connection with Recent Earthquakes in the Western Cordillera".

The luncheon was held Thursday April 7, 1960, in the Rodger Young Auditorium, Los Angeles.

Shell Oil's Ventura County Tax Bill

Ventura's number one taxpayer recently presented the county with the biggest tax check it has ever received —and probably bigger than any payment it will ever receive in the foreseeable future.

The tax check was for $2,178,469.54. It represented the final installment of the 1959-60 $4,356,939 county tax bill of Shell Oil Company and Shell Chemical Company and is the largest ever made by Shell on the West Coast.

The first installment, just three cents less than today's record-setting payment, was paid last December.

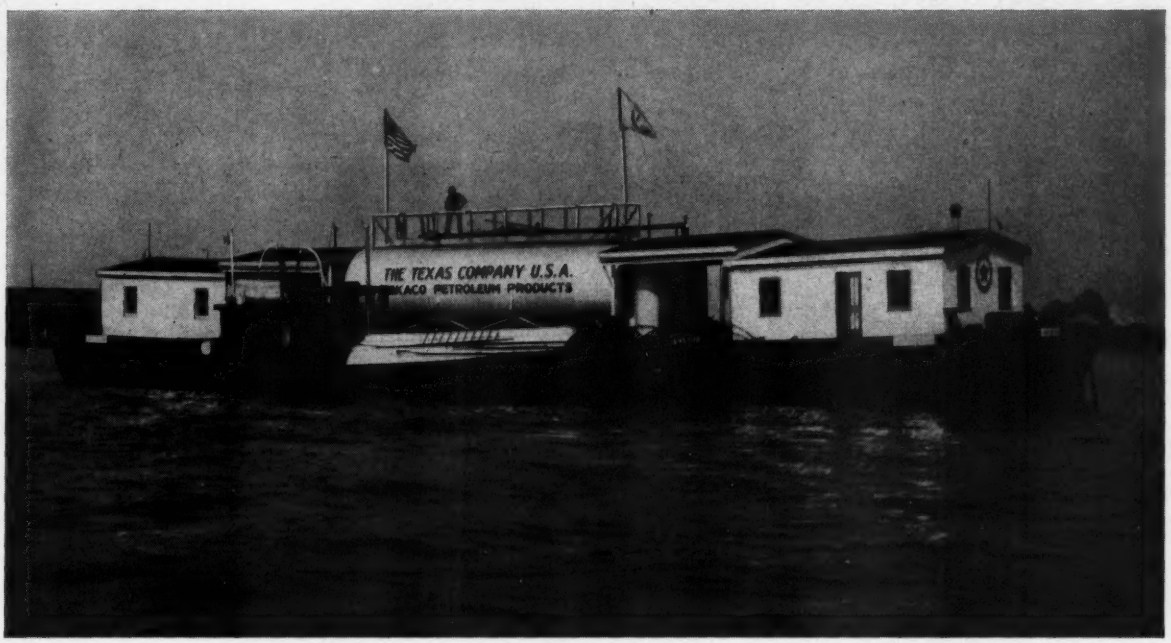
Occidental Petroleum Wins Control of Parker Petroleum Co. of Okla.

Occidental Petroleum Corporation has won control of Parker Petroleum Co., Inc., of Ponca City, Oklahoma, according to Dr. Armand Hammer, Occidental's president.

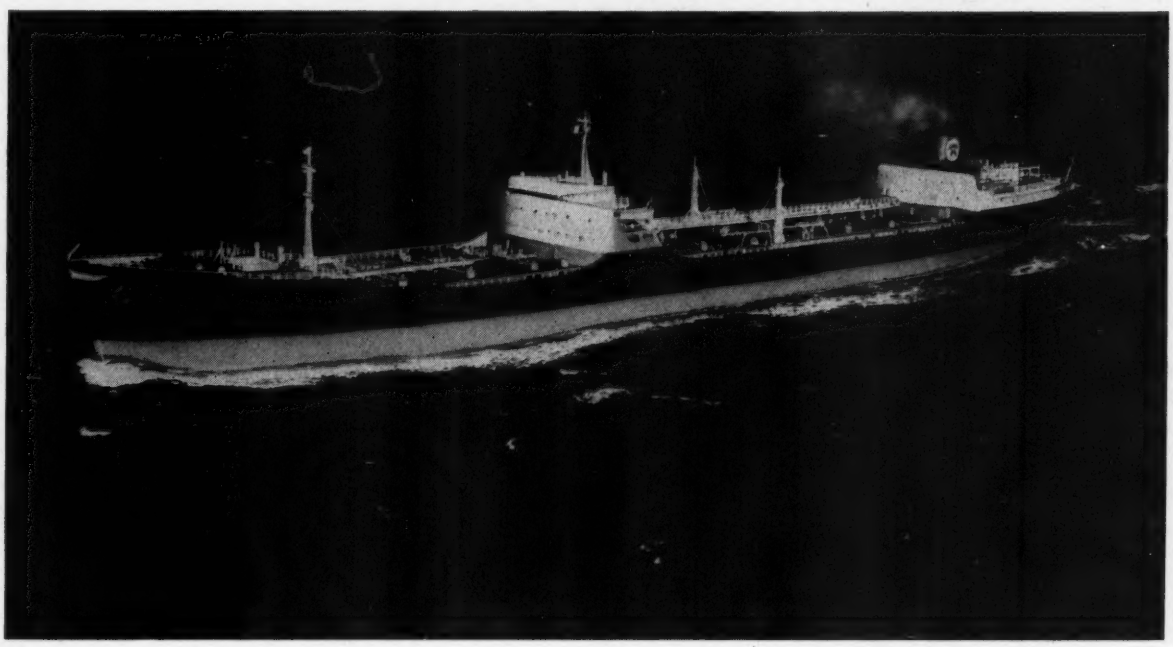
Judge W. R. Wallace of the U.S. District Court in the Western District of Oklahoma announced in court recently at Oklahoma City that Parker's stockholders and creditors had approved Occidental's plan for reorganization of the Parker firm. Almost 100% of the creditors and approximately two-thirds of the preferred and common stockholders voted in favor of Occidental's plan.

Under rules of the court, Occidental will take actual possession of Parker in approximately thirty days. It marks the first move for Occidental into the States of Texas and Kansas. In these two States and Oklahoma, Parker has varying interest in 202 producing oil and gas wells on 52 leases involving some 17,822 acres, and considerable undeveloped acreage.

From coastal to global operations



YESTERDAY—Shortly after its founding in 1902, Texaco had only one, small, wooden barge—transporting crude oil slowly along the Gulf Coast and up the Mississippi. Its capacity was 170,000 gallons.



TODAY—Texaco's giant steel tankers, like the Trinidad, ply the sea lanes of the free world, carrying up to 13-million gallons. This fleet forms part of a vast transportation network that helps keep the economy of the free world in balance. Continued Texaco growth, national and global, makes this possible.

TEXACO

ENGINEERING AID—Details of drilling and recording of technical petroleum data are facilitated by "on the spot" verbal recording through use of the new Transicorder, produced by American Concertone Division, American Electronics, Inc. Portable, and weighing less than four pounds, the equipment may be used by all field personnel due to the Transicorder's simplicity and versatility of battery operations.

New Portable Tape Recorder For Recording Data in Field

A new book size, portable tape recorder, weighing under four pounds and operating from its own built-in batteries, will considerably facilitate the recording of petroleum industry data in the field, according to George Otis, vice president, American Electronics, Inc., American Concertone Division, Culver City, Calif., introducers of the new Transicorder.

Now available, the Transicorder features over one hour of continuous dictating capacity, plus reusable tape, which allows the recording of conferences or discussion by petroleum supervisors or inspectors in the field, where normal dictating equipment, requiring electric power sources, cannot be utilized. Also featured are a built-in speaker and a versatility of power source, in addition to play-back of data.

Among the many other portable recording uses in the petroleum industry for the new Transicorder include: dictation of data collection on analysis of petroleum samples, operational information on pipe line flows, location of oil flow, and checking of oil equipment for mechanical difficulties. These items may be obtained by virtually any employee in a field or office situation where "on the spot" verbal recording of data or information is needed.

To prolong battery life, the Transicorder can also be operated from 110 volts office current, or from the cigarette lighter recepticle of a car, as desired. Accessories for the Concertone Transicorder include hand and foot operated remote controls, telephone pick-up and adapters for 12 volt DC and 110 volt power.

Fully transistorized, the complement includes six transistors and two diodes. The head complement consists of two heads, the record play-back unit and the erase head, which permits the indefinite re-use of standard ¼ inch tape with improved fidelity.

Of particular interest to petroleum engineers, Otis said, is the play-back feature, which permits the operator to listen to his recorded notes and data, at any time following recording, either for review of notes or for transcription to typed reports.

M-H Moves Into Moderate-Price Computer Field

A computer that is expected to make high-speed electronic data processing practical for more than 6,000 of the 10,000 top companies in the U.S. was recently introduced in Los Angeles by Datamatic Division of Minnepolis-Honeywell. It is rated as able to perform 6,000 operations per second.

Introduction of the new system, known as the Honeywell 400, broadens Honeywell's line to include moderate-price as well as larger data processing equipment, and represents a major expansion of Datamatic Division's activity in the computer business.

Unique Test Well Completed By Schlumberger To Pretest Logging Equipmer t

One of the world's most unusu l wells has been completed at Schlun - berger Well Surveying Corporation s Houston plant. The unique well wa s drilled to test newly built equipmen t to insure that it functions properl y when it arrives in the field. Since 1945 Schlumberger has checked out each surveying unit, downhole instrument, and control panel in a well cased with porous and permeable concrete tile. The new well increases the scope and efficiency of tests that can be made on today's more complex logging tools.

The new test well was drilled to 800 feet with a diameter of 9" and logged with every device in the Schlumberger catalogue of services. The hole was

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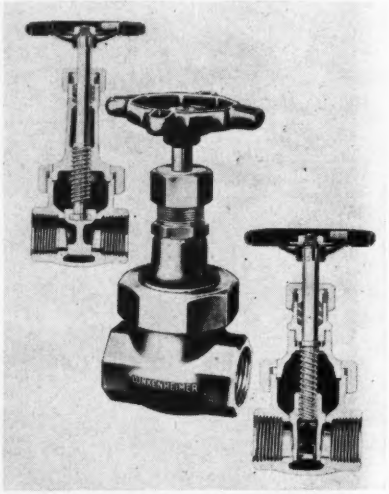

NEW SERIES OF UNION BONNET BRONZE GATE VALVES, introduced by the Lunkenheimer Co. of Cincinnati, Ohio. Designated as Fig. 3125, Fig. 3127 and Fig. 3129, these valves feature extremely rugged bodies, reinforced at all stress points, for greater plant and personnel safety and reduced valve maintenance costs. Especially designed and precision manufactured, they are available with single and double wedge discs and rising and non-rising stems for 125 lbs. S. P., 200 lbs. W.O.G. pressure applications.

then reamed to 14⅝" and a 100-foot surface string was set.

The major design problem, the solution of which gives the well its unique character, was to case the remainder of the hole in order to avoid caving and to still retain the open hole characteristics necessary for running open hole logs. Schlumberger's engineering department cooperated with Randolph Manufacturing Company of Houston in designing and developing a semi-conductive casing made of fibre glass cloth, and cemented with Epon plastic which had been impregnated with carbon and iron filings.

While cased hole logging instruments may be checked in the steel-cased section of the well, the effect of the plastic casing and conductive cement is to provide a well which is equivalent to open hole for testing logging devices of all types—electrical, radioactivity, and sonic.

For even more effective use the conductive plastic pipe string is interrupted by sections of the same pipe with high resistivity and by sections into which slight amounts of radioactive materials were introduced. These sections supplement the natural radioactivity and resistivity variations of the formations behind the casing to reproduce conditions encountered in logging deeper wells and in geological areas outside the Gulf Coast.

Double Warning Signal Provided By New 3-Phase Fault Detector

The 3 Phase Fault Detector indicates faults in any three phase power system and instantly provides warning by flashing lights and sounding a warning horn. Manufactured by the General Kinetics Corporation of Burbank, Calif., this new, completely transistorized device detects even minute leakages from any phase to ground.

The unit detects minute faults instantly, thus preventing electrical breakdowns that result in overheating, explosions, motor burnouts, expensive downtime, fire or shock hazard, personnel injury or death.

The unit is compactly designed, requiring only 11½" x 14¼" wall space for mounting. It contains no relay contacts to fail and no tubes to burn out. It may be quickly and easily installed by any maintenance man with regular tools, and after simple first adjustment

New Fault Detector for 3 Phase Systems

requires no further adjustments.

For information, write General Kinetics Corporation, 3151 Kenwood Avenue, Burbank, California.

New Off-Shore Drilling Program

Phillips Petroleum Company, Pauley Petroleum, Inc. and associates have announced plans to set a permanent drilling platform in 100 feet of water on their 3840 acre offshore California State Lease approximately 40 miles west of Santa Barbara. The platform will be set and ready for development drilling operations in September and will be designed originally to provide space for drilling 33 wells. Phillips Petroleum Company is the Operator for the group who paid $5,100,000 for the lease at the State Sale in June, 1958.

This same group has announced plans to immediately drill a directional well from an onshore location into its second 3840 acre offshore California State Lease approximately 17 miles west of Santa Barbara. The group paid $13,550,000 for this lease at the same State Sale.

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Gasoline Engine Dominant Power Plant in Automobiles

Five years from now, Americans will be driving almost 15 million more cars than they are at present, John S. Wintringham told the Lead Industries Association meeting in St. Louis this month.

Wintringham, who is a member of the research staff of the Ethyl Corporation laboratories in Detroit, said that the gasoline engine will continue to be the dominant power plant in automobiles.

By the end of 1964, he declared, our car population will grow from 56.5 million to 71.4 million vehicles. At the same time, gasoline consumption for all uses will rise from its present 57 billion gallons annually to 67.1 billion gallons.

No competitive power plant is likely to replace the gasoline engine in passenger cars, Wintringham said.

In the case of gas turbines, he declared, their high cost, relatively poor fuel economy and slow acceleration are major drawbacks. On the other hand, he said, the free-piston engine is heavy, noisy, relatively expensive and hard to start in cold weather, and it cannot match the fuel economy of the gasoline engine. Battery-powered cars are low-powered and have limited driving range—50 to 80 miles—before needing to be recharged, he pointed out.

Discussing other potential power plants, Mr. Wintringham said that fuel cells, in which chemical fuel and an oxidizer react to form electricity, occupy about four times as much space and weigh about four times as much as a gasoline engine of the same horsepower.

Continuing, Wintringham said that the Sterling engine, which uses external combustion, does not respond well to required changes in load, and may be costly to produce for vehicle use. And, he added, the recently announced gasoline engine, which uses a triangular rotor instead of pistons, poses difficult sealing and lubrication problems that must be solved.

Accordingly, Wintringham concluded, it does not appear likely that any alternate power plant will replace the gasoline engine in passenger cars. The influx of compact American and foreign cars may in time affect the size of engines in full-size cars, as well as their weight and dimensions, he pointed out. Nevertheless, he added, the continuing increase in the car population will increase gas consumption.

Field Development

Pacific Coast and "4" Corners

LOS ANGELES BASIN

Newhall Area Wildcat

Sunray Mid-Continent Oil Company is grading rig site for S.M.C.-McCulloch-Wilson No. 1, a wildcat test located in the northeast quarter of Section 5-3n-16w. The well will be a 12,000 foot test and is about 1½ miles southeast of the Newhall-Potrero field.

Seven Brea Canyon Wells

Brea Canon Oil Company will drill four new wells in the field. Wells number 76, 77, 78 & 79 are located in Section 2-3s-10w. Shell Oil Company has let a contract to C. T. Gates Drilling Company to drill three wells on the Columbia lease. Wells number 46, 47 & 48 will be drilled in Section 8-3s-9w.

Sansinena Completion

Union Oil Company completed another excellent producer in the field. Sansinena No. 5B-91 was good for 783 b/d of 26.5 gravity oil cutting 2 per cent flowing through a 41/64" choke with 447 mcf of gas per day with 190 pounds on the tubing and 540 pounds casing pressure. The well was drilled to a total depth of 5363 feet and was plugged back to 4980 feet. 7" casing with perforations from 4975-2685 feet was landed at 4975 feet and cemented through ports at 2685 feet. The surface location of the directionally drilled hole is in the southeast quarter of Section 30-2s-10w and is the eighth well under Union's current drilling program in the field. The eight wells have an aggregate initial production of 2863 barrels per day. A ninth well is currently underway.

Beverly Hills

Universal Consolidated Oil Company recompleted 20th Century Fox No. 4F flowing 350 b/d of 23.0 gravity oil with a 1.7 per cent cut. The well was drilled to a total depth of 9402 feet and plugged back and redrilled to 7509 feet. 7" casing is cemented at approximately 5500 feet. Surface location of the well is near the intersection of Fox Hills Drive and Santa Monica Blvd. in Section 26-1s-15w. Universal is currently preparing another Island for several more wells in the area.

Union Drills Second Test

In the town lot area near the intersection of Pico and La Brea Blvds., Union Oil Company skidded the derrick ten feet west of their first test and are drilling below 3000 feet on Union-Signal-Pacific Electric No. 2 located in Section 27-1s-14w. Union-Signal-Pacific Electric No. 1 was drilled to a total depth of 9512 feet and was plugged and redrilled to 6186 feet and is standing suspended. 7" casing is cemented at 4800 feet.

NORTHERN CALIFORNIA

Stanislaus County Gas Test

Trico Oil and Gas Company is drilling below 5800 feet on Great Basins-KCL-Thompson Unit No. 1 located in the southwest quarter of Section 22-4s-7e one mile northwest of the town of Grayson. The well will be a 6500 foot test and is being drilled on a 3000 acre block on a farmout from Great Basins Petroleum Company and Kern County Land Company.

Brown Abandons Gas Test

Brown Drilling Company abandoned C. D. Chase No. 1, a Basal Capay test, after drilling to a total depth of 3750 feet. The well was located in the northwest quarter of Section 5-2n-8e, eleven miles northwest of Stockton in San Joaquin County.

San Joaquin County Test

Five miles north of the Vernalis Gas field, Great Basins Petroleum Company is preparing to spud Signet-Whitting No. 66-23 located in the southeast quarter of Section 23-2s-6e. Ben Owens has the contract to drill this 6000 foot test.

Gas Test Abandoned

Christiana Oil Corp. drilled to a total depth of 6567 feet and abandoned Lake No. 34-24 without testing. The test was located five miles northeast of the Vernalis Gas field in the northwest quarter of Section 24-2s-6e.

Reserve Drills Stockton Test

Reserve Oil and Gas Company's Berdot No. 71-63 drilled to 3933 feet and is preparing to run a formation test. On a test of the interval 2585-2621 feet recovery was 2000 feet of salt water testing 500 g/g. The test is located in the southeast quarter of Section 20-2n-7e in San Joaquin County.

Yolo County Gas Test

In the Esparto area, Rinde Oil Company is preparing to spud Driver No. 1 located in the southwest quarter of Section 29-10n-1w. The well will be a 5000 foot test of the Upper Cretaceous Sands and is located on a 3000 acre block seven miles south of the Dunnigan Hills Gas Field.

Humboldt County Wildcat Test

Zephyr Oil Company has surveyed in the location for Leon-Oro-Blanco No. T-1 near the center of the southeast quarter of Section 6-3n-1w and Ben Owens Drilling Company is moving in rotary. The location is about three miles northwest of the Eureka Gas field and will be a 6000 foot test. Two more tests will be drilled on the 20,000 acres under lease.

San Joaquin County Completion

Brazos Oil and Gas Company completed Brazos-Sunray-M & T No. 3 flowing 1750 mcf of gas per day through a 14/64" bean with 1500 psi flow pressure. Shut in pressure is 1635 psi. The well, a southeasterly extension test, is located in the southwest quarter of Section 14-14n-4e, was drilled to a total depth of 5792 feet and cemented 5½" casing at 4225 feet. The well was completed from the perforated interval 4105-4114 feet.

Yolo County Wildcat

Four miles east of the Millar Gas area, Ted Sterling, Operator, is grading rig site for Union-Ameraca-

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Vaughn No. 1 located in the southwest quarter of Section 4-6n-3e. The well will be a 8500 foot Winters Sand test and is on a 12,000 acre block 3½ miles east of the Millar Gas field.

Glenn County Gas Test

Humble Oil & Refining Company is preparing to grade road and rig site for McGowan Brothers No. 1 located in the southwest quarter of Section 29-19n-1e. The test falls 3½ miles northeast of the Afton Gas field.

San Joaquin County Wildcat

In the Roberts Island area, Arcady Oil Company is preparing to spud Paga Ranch No. 2-11 located in the northwest quarter of Section 11-1n-5e. Rusty Walters Drilling Co. has the contract to drill the 6000 foot test.

Solano County Gas Test

Shell Oil Company is grading roads for Winters Unit No. 2-2 to be drilled in the southwest quarter of Section 19-8n-1e. The test is a Winters Field development well.

San Joaquin County Completion

In the Vernalis area, Standard Oil Company completed Blewett Community No. 10 flowing 2825 mcf of gas per day through a 5/16" bean with flow pressures of 1155/1250 psi. Drilled to a total depth of 4198 feet, 5½" casing was cemented at 3680 feet and on a test of three perforated intervals within 3504-3602 feet recovery was water. The hole was plugged back inside the casing to 3454 feet and casing perforated from 3075-3055, 3050-3043, 3036-3010 feet. The completion is located ½ mile northeast of production in the northeast quarter of Section 23-3s-6e.

Humble Gas Test

In the Dixon area in Solano County, Humbe Oil & Refining Company has staked a location for May M. Collier No. 1, a wildcat gas test located in the southwest quarter of Section 6-7n-2e, southwest of the Winters Gas field.

Two San Joaquin County Tests

Porter Sesnon and Great Basins Petroleum Company et al have staked locations for two new wells in the Vernalis Gas field, both offsetting production. Mohawk-Baltzen-Hunter Unit 4 Well No. 63-16 will be drilled in the northeast quarter of Section 16-3s-6e and Sesnon-Vernalis Unit 3 well No. 26-22 in the southwest quarter of Section 22-3s-6e.

Elkhorn Area

Ferguson and Bosworth, Operator, are grading location for Bryan No. 1 located in the southeast quarter of Section 23-10n-4e in Sacramento County. This is a 6000 foot test, about ten miles north of the town of Sacramento, and is a joint test with the Golden Bear Oil Company.

COASTAL AREA

Ventura County Wildcat Test

Three miles north of Oxnard Field production, Humble Oil & Refining Company has staked location for a wildcat test, Coffman No. 1, in the southeast quarter of Section 18-2n-21w. The well will be a 12,000 foot test.

Ventura County Deep Test

Shell Oil Company is grading roads and rig site for Pagenkopp No. 1 to be drilled in the southwest quarter of Section 11-4n-20w. Location for the 15,000 foot test is two miles southwest of the Little Sespe area production.

Offshore Test Resumes Operations

Standard Oil Company resumed operations on an offshore well originally drilled as Standard-Humble-Summerland State No. 7 and is redrilling the well, now designated as No. 7-A, below 3000 feet. Located offshore from Summerland in projected section 35-4n-26w, the well was originally drilled to a total depth of 9541 feet and suspended operations in December 1959.

Shallow Test Abandoned

In the Moorpark area in Ventura County, Revo Oil Company abandoned Herrington No. 1 at a total depth of 1010 feet. Location of the test was in the southwest quarter of Section 21-3n-19w.

West Montalvo Completion

Standard Oil Company completed Standard-Sunray-Ohio-Scarlett No. 2-A flowing, on a gas lift, 165 b/d of 15.5 gravity oil with a cut of 7.6 per cent. Flow is from selectively perforated intervals within 11,096-11,310 feet. Originally drilled as Well No. 2 and abandoned at a total depth of 12,250 feet, the well was redrilled to its present depth of 12,150 feet and cemented 7" casing at 12,132 feet. The completion is located in the northwest quarter of Section 31-2n-22w.

Cojo Offshore

Phillips Petroleum Company has staked location for another offshore well, Phillips Petroleum-Pauley et al-State 2207 E. T. No. 11, in projected Section 14-4n-34w in Santa Barbara County.

SAN JOAQUIN VALLEY

New Zone Discovery For Kern Oil

On a test of the interval 8076-8086 feet, a new zone between the JV and Z Sand, Kern Oil California Limited's KCL No. 85X, located in the southeast quarter of Section 25-11n-20w in the Wheeler Ridge field, flowed at a 720 b/d rate on a 1½ hour test. Gravity of the oil is 37.8 degrees with a cut of 2 per cent. Flow was through a 18/64" bean with gas flow gauged at 460 mcf per day rate. A test of the Z Sand is underway. The test was drilled to a total depth of 9175 feet and cemented 7" casing at 7805 feet and has a 5" blank liner cemented at 9172 feet.

Tulare County Test Abandoned

Sam B. Herndon drilled to a total depth of 5774 feet and abandoned Hagler No. 1 without testing. The well was located five miles east of the Hanford area in the northeast quarter of Section 2-19s-23e.

Edison Outpost Test

Di Giorgio, Bunting and Olson are ready to spud Baughman No. 1, a 4000 foot test located in the northwest quarter of Section 8-30s-29e. The rig site is approximately 1000 feet south of production.

Twenty Coalinga Locations for Shell

Shell Oil Company has surveyed in locations for twenty new development wells in the East Coalinga field. One well will be drilled in Section 2-20s-15e, three in Section 10, two in Section 14, one in Section 26, five in Section 27, two in Section 29 and six in Section 34, all in Twp 19s, R. 15e.

Belgian Anticline Activity

The Ohio Oil Company completed F. E. Smith Government No. 8 flowing 1594 b/d of 34.2 gravity oil with a cut of 0.2 per cent mud. Flow was through a 21/64" bean with pressures of 730/640 psi and 572 mcf of gas. The well was drilled to a total depth of 6175

feet and cemented 7" casing at 6167 feet. Casing was gun perforated from 6118-6098 feet and 6086-6075 feet. The completion is located in the southwest quarter of Section 14-30s-21e. The Ohio Oil Company has plugged and is milling through 7" casing to redrill F. E. Smith No. 2-A, formerly completed as well No. 2, from 3550 feet. Located in the northwest quarter of Section 23-30s-21e, the well was first completed at a total depth of 6000 feet.

Shell Oil Company completed P.M.L. No. 26-14 flowing 682 b/d with a cut of 0.6 per cent. Flow was through a 24/64" bean with pressures of 550/40 psi and 297 mcf of gas. The well was drilled to a total depth of 7496 feet and redrilled to 6437 feet. 5½" casing was cemented at 6213 feet and plugged back inside the casing to 6174 feet. The 5½" casing was gun perforated from 6090-6145 feet. The well is located in the southwest quarter of Section 14-30s-21e. Shell is preparing to spud P.M.L. No. 47-14, a northerly offset to The Ohio Oil Company's F. E. Smith No. 8, located in the southwest quarter of Section 14-30s-21e. Also, approximately 3500 feet northwest of production, Shell Oil Company is grading location for Southern California Petroleum No. 75-7. The well will be drilled in the southeast quarter of Section 7-30s-21e.

North Tejon Completion

Reserve Oil & Gas Company completed BW-T No. 37-20 flowing 233 b/d oil with a cut of 42 per cent. Flow was through a 32/64" bean with pressures 180 psi and 1172 mcf of gas. Located in the northeast quarter of Section 20-11n-19w, the well was drilled to 14,528 feet and plugged back to 10,298 feet. 7" casing was cemented at 12,808 feet and spot perforated in the Z-1 Zone at 11,980 feet, 11,950 feet, 11,924 feet and 11,884 feet.

Helm-Lanare Area Test

R. B. Montgomery, Operator, is preparing to spud Goyne-Rheem-Hawn No. 38X-24, an outpost test located in the southwest quarter of section 24-17s-18e. The well will be the first of two 7000 foot Miocene tests on a 1000 acre farmout from Tom Goyne. The second test will be drilled in Section 8 and location for a third well will be announced later.

Richfield Completion

In the North Tejon field, Richfield Oil Corp. completed ROC-KCL-G No. 56-24 flowing 190 b/d of 52.3 gravity oil cutting 0.3 per cent through a 16/64" bean from the Z-1 Sand, and from the Z-O Sand production was 311 b/d of 35.7 gravity clean oil, flowing through a 11/64" bean. The well was drilled to a total depth of 11,250 feet and has 7" casing cemented at 10,825 feet. A 5" perforated liner is hung at 1,248 feet. The well is located in the southwest quarter of Section 24-11n-20w.

Wheeler Ridge Completion

Richfield Oil Corp. completed KCL-L No. 23-36 flowing 275 b/d of 20.2 gravity oil with a cut of 1.8 per cent. Flow was through a 1½" bean and gas flow was 62 mcf. Total depth of the well is 5777 feet and has 7" casing cemented at 5638 feet. A 5½" liner with perforations from 5632-5775 feet is hung at 5775 feet. The completion is located in the northwest quarter of Section 36-11n-20w.

OTHER AREAS

Alaska

Colorado Oil and Gas plan to spud about July 1st on Dangerous River No. 1, a 8500 foot test in the Cape Fairweather area in the northeast quarter of Section 17-29s-37e, Company tools will be used.

Montana

Honolulu Oil Corp. is grading roads and rig site for a Yellowstone County wildcat. Location for the well, Bender No. 2-9, is in the southeast quarter of Section 2-4n-25e and will be a 5900 foot Tensleep Sand test.

Texaco Inc. cemented surface casing and is drilling below 2000 ft. on Ofstadel No. 1, a Daniel County wildcat test. Located in the northwest quarter of Section 24-36n-47e in the Whiskey Butte area, the well will be a 9200 foot Winnipeg test.

Oregon

Reserve Oil and Gas Company is surveying location for a Polk County test nine miles northwest of the town of Salem. The well, Roy L. and G. Bruer No. 1, will be drilled in the northwest quarter of Section 31-6s-4w.

Utah

The Ohio Oil Company is preparing to drill Wolf No. 1 in the northeast quarter of Section 8-11s-21e, Unitah County. The area to be tested is approximately twenty miles southwest of the Chapita Wells production and will be a 7100 foot Mesaverde test.

In the Desert Creek area, San Juan County, Davis Oil Company has graded location for Navajo No. B-1 in the northeast quarter of Section 17-42s-23e. The location is six miles northeast of the Akah Field and will be a 6600 foot Paradox test.

Wyoming

Sinclair Oil and Gas Company completed Mary Wilson No. 2 as the most easterly producer of the Rozet field in Campbell County. On a pump test the well was good for 190 b/d of oil and 30 b/d of water from the Muddy perforations 6825-6838 feet. Located in the southwest quarter of Section 13-50n-70w, the well was drilled to a total depth of 7000 feet and cemented 4½" casing at 7000 feet.

Locations for four extension tests of the Barber Creek Field in Campbell County have been staked. Shell Oil Company will drill two extension tests on the west side of the field, Maycock No. 22-2 and No. 32-2 both in Section 2-49n-76w. On the southern end of the field, Farmers Union Central Exchange will drill Jameson No. 2 in the southeast quarter of Section 2-49n-76w and Jameson No. 3 in the southwest quarter of Section 1-49n-76w. Both wells will be 7400 foot Parkman tests.

Gulf Oil Company completed Tresner-State No. 19 flowing 2060 b/d of clean oil through a 32/64" bean from the Mesaverde perforations at 3118 feet. The completion is located in the southwest quarter of Section 36-29n-113w in Sublette County. The well was drilled to a total depth of 3327 feet and cemented 5½" casing at 3172 feet.

New Mexico

Pubco Petroleum Company completed State No. 26 flowing 3200 mcf of gas per day from the perforated interval 6394-6356 feet. The well was drilled to a total depth of 6560 feet and logged the top of the Dakota at 6882 feet. 5½" casing is cemented at 6560 feet. The completion is located in the southwest quarter of Section 36-29n-11w and is a field extension.

Western Natural Gas Company completed Krause-Federal No. 1 as a dual completion flowing 130 b/d oil from the Gallup perforations 5456-5462 feet and 3650 mcf of gas per day from the Dakota. Located in the southwest quarter of Section 32-28n-11w, the well was drilled to a total depth of 6640 feet and cemented 7" casing at 6640 feet.

THIS LAUGH OFF!!

He rounded the bend at close to sixty. A sudden skid and the car overturned. They found themselves sitting together unhurt beside the completely demolished auto. He put his arm around her waist, but she drew away.

"It's all very nice," she sighed, "but wouldn't it have been easier to have run out of gas?"

At a political convention, a sign had been erected near the speakers' platform for the benefit of press photographers. It read: "Do not photograph the speakers while they are addressing the audience. Shoot them as they approach the platform."

A cowboy went to the city for the first time and registered at a hotel. "Do you want a room with running water?" asked the clerk.

"Hell, no!" cried the cowboy, "What do you think I am—a trout?"

Peeved lecturer (who had told a story that failed to produce the expected outburst): "Well, I suppose you folks will laugh at that story next summer."

Voice in the audience: "No, sir; we laughed at it last summer."

"Were there any powder marks on the body of your dead husband?" asked the coroner.

"Certainly, there were powder marks," said the wife. "That's why I shot him!"

An old farmer was telling his neighbor about seeing his first movie. "Yep, 'twas good," he said, "but there was one scene where a bunch of girls started to undress to go swimming. Then a train would zoom by and the next thing the girls would be in the water. I sat through four shows waitin' for that durn train to show up late!"

"Pa!"

"Yeah, Son?"

"How come Noah didn't swat both flies when he had the chance?"

"Father," asked the small boy, "which can go faster, horses or buses?"

"Buses, of course," replied the father impatiently.

"Then why," asked the boy, "don't you bet on the buses?"

Insurance Agent: "Now that you're married and have the responsibility of a wife, you will want to take out some insurance."

Mr. Newlywed: "Insurance? Shucks, no. Why she's not the least bit dangerous."

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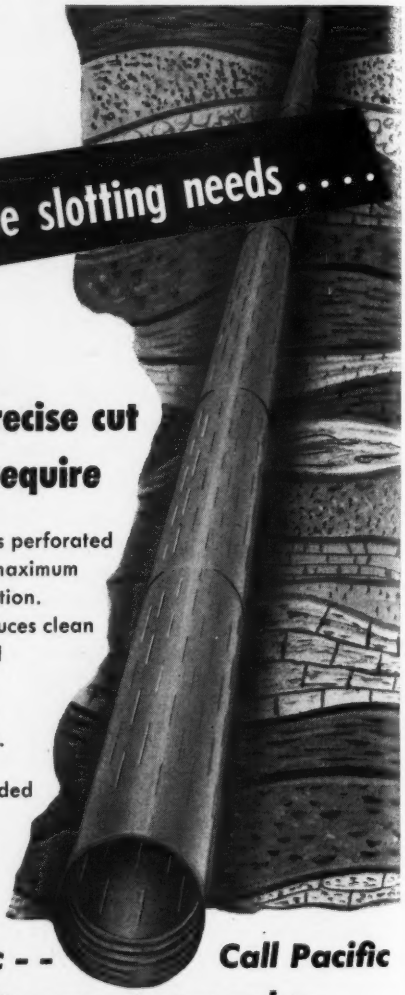

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The trick is to accurately record these "fingerprints" in detail and to provide the instrumentation and experience necessary to reliably evaluate the nature of the formations – that's where McCullough comes in!

McCullough provides the many specialized nuclear logging services listed below. Each employs the highly sensitive Scintillometer. Each is designed to perform a specific function – to identify and to reveal maximum information about those formation characteristics to which it is responsive, with great accuracy.

McCullough Nuclear Logs are clear, detailed, accurate and repeatable. Our many years of experience have developed techniques of interpretation and evaluation that reveal full formation information – with reliable accuracy.

On that next job, it will pay you to let McCullough "fingerprint" your well – and interpret those "fingerprints" to reveal the true nature of sub-surface structures.

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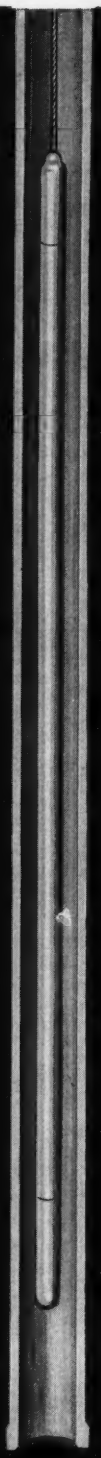
McCullough Nuclear Well Logging Services

Gamma Ray Log, Neutron Log or simultaneous Gamma Ray-Neutron Log in cased or open hole.

- Salinity Log and combinations of Salinity-Gamma Ray-Neutron curves in cased or open hole.
- Multiple Spaced Neutron Log in cased or open hole.
- Tracer Service with Sub-surface Injector or surface injection.
- Density Log, simultaneous Density-Gamma Ray Log and combinations of Density-Salinity-Gamma Ray-Neutron curves in open hole.
- Cement Log.
- Simultaneous Collar Log recorded with all Nuclear Logs in cased hole.



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